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III. AMENDMENTS TO THE DRAWINGS

None.

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IV. REMARKS/ARGUMENTSRECEIVED
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Claims 1-12 are pending in the Application.

Though no objection was raised, applicants are providing amendment to paragraphs [0005], [0041] [0043], [0044], [0051] and [0052] to provide patent number information and remove attorney docket numbers as appropriate.

Double Patenting Claim Rejections

Claims 1-7 and 11-12 were provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-27 of co-pending U.S. Patent Application No. 10/686,510. Applicants are submitting herewith an executed Terminal Disclaimer to obviate the provisional double patenting rejection over copending Application 10/686,510 in compliance with 37 C.F.R. 1.321 (c). The Terminal Disclaimer then effectively overcomes the provisional rejection. Any fees associated with this Terminal Disclaimer may be charged to General Motors Deposit Account No. 07-0960. A separate Fee Transmittal sheet (PTO/SB/17) is enclosed for this purpose.

Claim Rejections under 35 U.S.C. § 102

Claims 1-3, 11 and 12 were rejected under 35 U.S.C. § 102(b) as being anticipated by USPN 5,833,570 to Tabata et al. (hereafter Tabata et al.). Claims 8-10 were rejected as being anticipated by USPN 6,019,699 to Hoshiya et al. (hereafter Hoshiya et al.). Claims 4-7 were objected to as being dependent upon a rejected base claim, but would be allowable if

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rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Applicants appreciate the recognition of patentable subject matter in claims 4-7. Independent claims 1, 8 and 11 have been amended to more particularly point out and distinctly claim the subject matter which applicants regard as their invention. Applicants respectfully request entry of these amendments and re-examination of all claims in view of these amendments and the following clarifying remarks.

The present invention relates to shift control in an electrically variable transmission or EVT. The EVT has an input and an output and is capable of a variety of operations – including continuously variable ratio mode operations, fixed-ratio operation and neutral operation. For expediency and simplicity of illustration only, torque transfer devices are referred to herein as clutches and such reference is not intended to limit the claim interpretation of torque transfer devices to only clutches. In fixed-ratio operation, a pair of engaged or applied clutches establishes a mechanical coupling from the input to the output through a fixed ratio. To contrast, in a continuously variable ratio mode operation one of the clutches is applied and the other clutch is released, the input is coupled to the output through a continuously variable ratio. Either clutch may be the applied clutch with the other clutch serving as the released clutch thereby establishing a first mode operation in one applied/released clutch combination and a second mode operation in the other applied/release clutch combination. In other words, in mode operation the input to output speed ratio is variable and there are two distinct mode operations –first and second – corresponding to specific clutch apply/release combinations of the first and second clutches. The actual speed ratios in either first or second mode operation are determined in accordance with electric machine speed and the particular geartrain established through the EVT as a result of the

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effected one of the first and second clutch apply/release combinations. Essentially, the amendments to the claims have made clear and distinguished these characteristics of continuously variable ratio mode operation, neutral operation and fixed ratio operation.

In many situations, it is desirable to shift from one continuously variable ratio mode to the other through an intervening fixed-ratio operation by first controlling slip speed across the unapplied clutch to zero, next applying that clutch and then releasing the other clutch in a similar controlled slip fashion. During the interval when both clutches are applied, a fixed ratio operation between the input and the output is established. In certain situations, however, it may be undesirable to shift from mode to mode with such an intervening fixed ratio. Therefore, the claims of this application establish a shift from one continuously variable ratio mode to another through an intervening neutral operation by first releasing the applied clutch such that neither clutch is applied, controlling slip across an oncoming clutch to substantially zero, and then applying that clutch to establish a continuously variable ratio mode. When both clutches are released, a neutral operation between the input and the output is established.

Independent claims 1, 8 and 11 all recite first and second mode operations of a multi-mode, electro-mechanical transmission as follows, with underlined portions referencing highlighted portions and not necessarily related to insertions by amendment in the present paper:

first mode operation characterized by simultaneous first torque transfer device applied and second torque transfer device released wherein the transmission input member is mechanically coupled to the transmission output member through a continuously variable ratio

second mode operation characterized by simultaneous first torque transfer device released and second torque transfer device applied wherein the transmission input member is mechanically coupled to the transmission output member through a continuously variable ratio

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Each mode operation is clearly defined with respect to distinct, inverted clutch apply/release combinations and continuously variable ratio coupling of the transmission input and output members.

Therefore, a method for controlling a mode to mode shift with such an intervening neutral operation in accordance with claim 1, for example, further requires the release of the applied clutch to establish neutral operation, then controlling slip across a clutch, followed by application of that clutch. Independent claim 1 in this respect recites:

while in one of the first and second modes, releasing the one of the first and second torque transfer devices that is applied to establish neutral mode operation;
controlling slip speed across one of the first and second torque transfer devices to substantially zero; and,
applying the one of the first and second torque transfer devices across which slip is being controlled when the slip thereacross is substantially zero.

The subject Office Action states that Tabata et al. discloses a multi-mode, electro-mechanical transmission. However, the transmission disclosed by Tabata et al. is not a multi-mode, electro-mechanical transmission as recited in applicants' independent claims. The transmission of Tabata et al. is not operative for mode operation as set forth in applicants' claims wherein apply/release combinations of a pair of clutches establishes respective first and second mode operations as recited in applicants' claims. More particularly, as detailed above with respect to the commonality of recitations found in applicants' independent claims 1, 8 and 11, Tabata et al. fails to disclose first mode operation characterized by simultaneous first torque transfer device applied and second torque transfer device released wherein the transmission input member is mechanically coupled to the transmission output member through a continuously variable ratio. Likewise, Tabata et al.

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fails to disclose second mode operation characterized by simultaneous first torque transfer device released and second torque transfer device applied wherein the transmission input member is mechanically coupled to the transmission output member through a continuously variable ratio. The speed ratios associated with the primary transmission 22 of Tabata et al. (see e.g. FIG. 3) are all fixed ratios and not continuously variable, thus negating any equivalency to applicants' mode operation. The clutches CE₁ and CE₂ associated with the electrically controlled torque converter 24 of Tabata et al. are not capable of effecting the first and second modes as recited in applicants' claims. Whereas the CE₁ applied and CE₂ released combination may establish a continuously variable ratio through the electrically controlled torque converter 24, the inverted CE₂ applied and CE₁ released combination does not establish another continuously variable ratio – instead, such combination completely decouples the input (engine 12) from the remainder of the drivetrain (front auxiliary transmission 20 and rear primary transmission 22) and directly couples the motor/generator 14 to the remainder of the drivetrain via a fixed ratio 1:1.

Therefore, the apparatus of Tabata et al. is not capable of effecting more than one continuously variable mode. And the particular clutch combinations recited in applicants' claims for effecting first and second modes if implemented in the apparatus taught in Tabata et al. do not result in first and second mode as recited in applicants' claims. Tabata et al. thus fails to anticipate applicants' claims for this reason alone.

It is also axiomatic that the mode to mode shift control of applicants' claims cannot be anticipated by Tabata et al. in as much as Tabata et al. fails to disclose the basic underlying first and second clutch combinations and resultant associated first and second modes recited in applicants' claimed methods for controlling mode to mode shifts.

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Anticipation requires the disclosure in a single prior art reference of each element of the claim under consideration. W.L. Gore & Associates. v. Garlock, Inc., 721 F.2d 1540 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984). However, it is not enough that that the prior art reference merely disclose all of the claimed elements. Anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim. Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co., 730 F.2d 1452, 1458 (Fed. Cir. 1984). The identical invention must be shown in as complete detail as is contained in the claim. Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Anticipation must be based on a single reference that describes the subject matter claimed in the patent with sufficient detail and clarity to demonstrate that the subject matter existed and that a person of ordinary skill in the art would have recognized its existence in the asserted prior art reference. ATD Corp. v. Lydall, Inc., 159 F.3d 534, 545 (Fed. Cir. 1998).

Applicants have demonstrated above that Tabata et al. fails to meet the requirements of anticipation in as much as each element of the claims is not found therein arranged as in the claims nor in as complete detail as contained in the claims. Tabata et al. also fails to describe the subject matter of applicants' claims with sufficient detail and clarity to demonstrate that the claimed subject matter existed and that a person of ordinary skill in the art would have recognized its existence in Tabata et al. In fact, Tabata et al. demonstrates with sufficient detail and clarity that the claimed subject matter of applicants' claims does not exist in Tabata et al. and that it cannot be carried out with the teaching of Tabata et al.

Regarding Hoshiya et al., a person of ordinary skill in the art will recognize the material equivalence of the disclosure to that of Tabata et al. A person of ordinary skill in the art will appreciate, for example, that the torque synthesizing/distributing mechanism 10 is

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the substantial equivalent of the electrically controlled torque converter 24 of Tabata et al. with clutch C_4 corresponding to clutch CE_2 and clutch C_1 corresponding to clutch CE_1 . Thus, Hoyisha et al. at column 5, line 40 through column 6, line 45 is also instructive to applicants' claim distinction over the teaching of both Hoshiya et al. and Tabata et al. as such cited portions clearly does not teach apply/release combinations of a pair of clutches establishing respective first and second mode operations as required in applicant's claims. The apparatus of Hoyisha et al. and Tabata et al. simply are not capable of effecting more than one continuously variable mode. Therefore, for the reasons set forth in clear detail above respecting the failure of Tabata et al. to anticipate applicants' claims, Hoshiya et al. also fails to anticipate applicants' claims.

Applicants have demonstrated above that Tabata et al. and Hoshiya et al. each individually fails to meet the requirements of anticipation in as much as each element of the claims is not found therein arranged as in the claims nor in as complete detail as contained in the claims. Tabata et al. and Hoshiya et al. each also fail to describe the subject matter of applicants' claims with sufficient detail and clarity to demonstrate that the claimed subject matter existed and that a person of ordinary skill in the art would have recognized its existence in the respective references. Therefore, applicants respectfully request reconsideration of the anticipation rejections in light of the claim amendments and remarks herein above.

Conclusions

A genuine effort to resolve all issues has been made. For the above cited reasons, all of the claims presently pending in this application are believed to be allowable. Applicants respectfully request reconsideration of these claims by the Examiner, and allowance so the present Application can proceed to issue.

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If the Examiner has any questions regarding the contents of the present changes, the applicants' attorney may be contacted at the phone number appearing below.

Any fees associated with this response may be charged to General Motors Deposit Account No. 07-0960.

Respectfully submitted,



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